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Financial Indicators and Growth in a Cross Section of Countries

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Financial indicators may be linked to growth through two “channels” in particular: the share of GDP allocated to investment and the efficiency with which resources are used. It is empirically important to identify which financial intermediaries are doing the intermediation and to whom the financial system is allocating credit rather than simply using proxies for the overall size of the financial system, as has been common in past studies.

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King and Levine use existing measures of the financial system — and construct many new measures — to document the relationship between the financial system and long-run growth in a cross-section of countries between 1960 and 1989.

They consider various measures of the size of the financial system, the importance of different financial institutions, the financial system's allocation of credit, the financial system's efficiency, and the degree of financial repression.

They use graphs, correlations, and regressions to gauge the robustness of the partial correlation between growth and the financial indicators. They also examine two "channels" through which financial indicators may be linked to growth: the share of GDP allocated to invest-

ment and the efficiency with which resources are used.

They find that many of the financial system indicators are significantly correlated with growth through both investment and efficiency. Moreover, many of these partial correlations remain strong after controlling for initial conditions, dummy variables for Africa and Latin America, and measures of monetary, fiscal, and trade performance.

King and Levine's analysis suggests that it is empirically important to identify which financial intermediaries are doing the intermediation and to whom the financial system is allocating credit rather than simply using proxies for the overall size of the financial system, as has been common in past studies.

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I. Introduction and Summary

Economists have long debated the nature and empirical importance of the relationship between financial systems and economic development.¹ Financial institutions such as central banks, banks, mutual funds, investment banks, and brokerage houses use a variety of financial instruments (currency, demand deposits, stocks, bonds, and options) to facilitate trade in goods and services and to funnel resources from savers to investors. By providing payment services, mobilizing savings, allocating credit, and allowing participants to pool, trade, and price risk, financial systems may improve the flow of information, the allocation of resources, and the management of firms in ways that promote economic development.²

Empirically documenting the relationship between financial systems and growth in cross-country studies is difficult because of the problems in constructing unambiguous measures of (1) the state of the financial system and (2) government policies toward financial activities. Many studies use measures of the size of the formal financial system relative to economic activity - *financial depth* - to quantify the level of financial development and then relate these measures to per capita income growth.³ To measure financial policies, some studies classify those countries with severely negative *ex post* real interest rates as "financially repressed" and then examine whether financially

¹ Schumpeter (1911), Cameron (1967), Goldsmith (1969), and McKinnon (1973) emphasize the pivotal nature of this relationship, while Lucas (1988) terms this relationship "over-stressed". Also, see the World Bank (1989), Gertler and Rose (1991), Roubini and Sala-i-Martin (1991), and Ghani (1991).

² Since financial services may positively affect growth, official interference in financial activities may retard growth, e.g., Roubini and Sala-i-Martin (1991) and Levine (1991a,b). Under some conditions, however, the existence of market imperfections implies that specific forms of official intervention would improve resource allocation and corporate control. See Stiglitz (1989).

³ McKinnon (1973) uses the ratio of M2 to GDP and Gelb (1989) uses the ratio of M3 to GDP to examine the relationship between financial depth and growth. Neal (1988) uses M1 to GDP, M3 to GDP, and M3 minus M1 to GDP to examine the relationship between financial depth and the level of income in 1985. In an impressively thorough study over the period 1860-1963, Goldsmith (1969) illustrates a positive relationship between per capita output and the ratio of financial institutions' assets to GNP in three dozen countries.

repressed countries tend to grow more slowly than non-financially repressed economies. Past studies commonly find that financial depth is positively related and financial repression negatively related to growth.

This paper has two objectives. First, we want to develop a set of "robust stylized facts" about the relationship between financial structure and economic growth, measured by the growth rate of per capita gross domestic product, in a large cross-section of countries over the 1960-89 period. Toward this end, the design of the study is in the tradition of recent cross-country empirical studies (as surveyed and critiqued by Levine and Renelt [1990, 1991]). Second, we want to undertake a preliminary exploration of the "channels of influence" by which financial indicators are related to growth. Thus, we decompose the relationship between our measures of financial structure and economic growth into consequences for (1) the rate of investment and (2) the efficiency of investment. Specifically, we explore empirical links between financial indicators and (1) the ratio of gross domestic investment to gross domestic product and (2) the ratio of the change in per capita GDP to gross domestic investment.

This paper uses the broadest possible selection of existing measures of the state of the financial system and policies toward the financial system - *and constructs a large number of new measures* - to document the relationship between the financial system and long-run growth in a large cross-section of countries over the 1960-89 period. Each of the financial indicators is subject to conceptual and statistical criticism. By using the broadest selection of indicators to date, however, we can determine whether the financial system indicators tell similar stories about the relationship between financial markets and growth. It is worth emphasizing that this is the first cross-country study of growth that constructs and uses (1) measures of the relative importance of different financial intermediaries and (2) measures of the distribution of assets by the financial system. Thus, this is the first study that we are aware of that analyzes the empirical linkages between long-run growth and both "which financial institutions are intermediating" and "to whom is the financial system allocating resources."

The paper uses four categories of financial system indicators. First, we construct traditional measures of the size of the formal financial system relative to GDP. The second category measures the relative importance of different financial institutions. Due to data limitations, this means examining the importance of deposit banks relative to the central bank in allocating credit. Third, we examine the relationship between growth and the distribution of assets by the financial system. In particular, we use the fraction of credit allocated to private enterprises. Finally, we consider two interest rate measures to identify "financially repressed" economies and to quantify "financial distortions." We classify those countries with real interest rates of less than negative five percent as financially repressed, and use the difference between the lending and deposit rates to measure (albeit with huge measurement and comparability problems) financial distortions.

The paper uses three methods to document the relationship between financial indicators and growth. First, we present bi-variate graphs and correlations to illustrate the ties between financial indicators and growth. Second, we use cross-country regressions with data averaged over the 1960-89 period to gauge the robustness of the partial correlation between growth and the financial measures after controlling for initial conditions - real per capita income and secondary school enrollments rates in 1960 - and indicators of monetary, fiscal, and trade policy.⁴ Finally, we use pooled cross-country, time-series regressions with data averaged over five year intervals during the 1960-89 period to further examine the robustness of the partial correlations between growth and the financial indicators and the channels through which this relationship runs.

⁴ These variables are chosen based on past empirical work. See, for example Barro (1991) and Levine and Renelt (1990, 1991).

Four main findings emerge:

- First, many financial indicators are significantly correlated with growth.
- Second, the partial correlation between growth and (1) measures of financial system size, (2) the fraction of domestic credit allocated by deposit banks, and (3) the fraction of credit allocated to private enterprises remains statistically significant after controlling for initial conditions, dummy variables for countries in Subsaharan Africa and Latin America, and measures of monetary, fiscal, and trade performance. Furthermore, the empirical relationships between growth and the financial indicators that measure (i) the fraction of credit allocated to private enterprises and (ii) the fraction of credit intermediated by banks remain significant even when the regressions simultaneously include measures of overall financial system size. This suggests that it is empirically important to identify which financial intermediaries are doing the intermediation and to whom the financial system is allocating credit rather than simply using proxies for the overall size of the financial system.
- Third, the financial performance indicators are highly correlated with each other, so that - although important differences undoubtedly exist - the basic correlations between financial system indicators and growth are not highly dependent on which financial indicator is chosen.
- The fourth major finding is related to the channels via which the financial indicators and growth are correlated. Although the cross-country regressions suggest that the financial system indicators tend to be robustly correlated with growth only because they are highly correlated with the ratio of national investment to GDP, the pooled cross-country, time-series analyses suggest that the financial indicators and growth are linked through both the investment and "efficiency" channels.

This paper's findings suggest some important areas for future research. In addition to constructing better measures of financial performance, policy oriented research should attempt to construct proxy measures of public policies toward domestic financial intermediaries for a broad selection of countries.⁵ Although we may expect that there is a relationship between policies toward domestic financial intermediaries and intermediary performance, directly linking measures of policy with growth would be more informative than linking general measure of financial intermediary performance with growth.

Moreover, future research into the relationship between financial services and long-run growth will need to confront issues associated with causality and the inter-relations among public policies. The current paper has studied the strength of the partial correlation between growth and indicators of financial performance; it has not examined whether the provision of financial services stimulates economic growth. Future work may be able to employ instrumental variable techniques to examine whether financial performance affects growth. Similarly, although this paper presents evidence that growth and financial indicators remain significantly correlated even after controlling for other public policies, this paper has not examined the important interactions among public policies, including policies toward financial services, and growth that emerge from well-specified models [see Levine (1991), Roubini and Sala-i-Martin (1991) and Bencivenga and Smith (1990)]. Future research could begin to dissect the complex relationships among policies and growth.

⁵ See, for example, Giovannini and de Melo (1990) and Chamley and Honohan (1990).

II. The Size of the Financial System & Growth

This section uses four measures of the size of the financial system to broadly characterize the relationship between financial system size and growth.⁶

A. Measures of the Size of the Financial System

We consider four base measures of the size of the financial system:

M1Y: The Ratio of M1 to GDP. M1 is the sum of currency held outside of the banking system plus demand deposits at commercial banks (IFS line 34).

LLY: The Ratio of Liquid Liabilities of the Financial System to GDP. Liquid liabilities equal M1 plus interest bearing liabilities of the banking system, plus demand and interest bearing liabilities of "non-bank" financial intermediaries, e.g., savings banks, postal savings institutions, finance companies, etc. (IFS line 551, or IFS lines 34+35=M2).

QLLY: The Ratio of Quasi-Liquid Liabilities of the Financial System to GDP. Quasi-Liquid Liabilities equals Liquid-Liabilities minus M1.

DCPY: The Ratio of Claims on the Private Sector by the Central Bank and Deposit Money Banks to GDP (Domestic Credit to the Private Sector). (IFS line 32d)

The measures employed in the analysis are either (1) the average values of these four base measures over the sample period, or (2) the initial values of these four base measures in 1960.⁷ By using the average value of these four measures over the sample periods, we will be able to illustrate whether countries that grew faster over long time periods tended - on average - to have larger financial systems. By using the initial values of these measures, we can study whether countries that began the sample periods with large financial systems tended to grow faster than countries with smaller initial financial systems. Using the initial size of the financial system allows us to abstract from the

⁶ The analysis was conducted over the 1960-89 and 1974-89 periods to examine whether the conclusions depend on the sample period. We report only the 1960-89 results, and mention the 1974-89 findings when there are important differences.

⁷ Because the data series begin in 1960, the initial value overlaps one year with the 1960-1989 growth period.

potential causal mechanism of growth to the financial system and focus on the relationship between financial system size and subsequent growth.

The ratio of M1 to GDP (M1Y) is commonly used as a measure of monetary depth, while liquid liabilities to GDP (LLY) represents overall financial depth. We follow Neal (1988) and also define non-monetary financial depth as overall financial depth less monetary depth and call this measure of financial size quasi-liquid liabilities to GDP (QLLY). By eliminating the purely monetary component of financial size, quasi-liquid liabilities may more accurately capture the size of financial intermediation. In addition, we use the ratio of claims on the private sector by the financial system to GDP.⁸ This is both a measure of size and an indicator of asset distribution since it excludes financial credit to the government and publicly owned enterprises. Other measures of the distribution of assets by the financial system are examined in Section III below.⁹

The problem of deflating financial stocks - measured at the end of the period - by GDP flow - measured over the period - is mitigated by using the arithmetic average of this year's end-of-period and last year's end-of-period financial stock values. Thus, M1Y in 1965 is the average of M1 in 1964 and 1965, divided by GDP in 1965.

The data include the 119 developed and developing countries studied in Levine and Renelt (1991) and listed in the appendix below. The major oil exporters are excluded from the analysis, and data availability typically restricts the analysis to between 60 and 90 countries.

⁸ State owned enterprises are not considered part of the private sector.

⁹ We also considered the fraction of national savings intermediated through the financial system [Gelb 1989]: the real increase in liquid liabilities divided by real gross national savings. Although this indicator is also significantly correlated with per capita income growth, it did not remain significantly correlated with growth in the of simple regressions presented below.

B. Period Averages of the Size Measures and Growth

This subsection uses simple correlations and graphs to highlight the relationship between real per capita growth and measures of the average size of the financial system over the 1960-89 period.

Based on average real per capita growth rates over the 1960-89 period (GYP), we divide countries into four categories: very fast, fast, slow, and very slow growers, with an equal number of countries in each category. We then compute the mean of the financial size variables for each of the four categories over the 1960-89 period.¹⁰ Table 1 demonstrates the close link between average financial size and growth. Each measure of financial system size clearly portrays the same message: countries with faster growth rates tend to have larger financial systems. The accompanying graph further illustrates this "step" relationship using non-monetary financial depth.

Formal statistical tests of the correlation between average financial size and growth are provided in the last column of Table 1. The Pearson Correlation Coefficient is significantly positive at the 0.01 level for each of the measures of average financial size and growth.

C. Initial Measures of Finance Size and Subsequent Growth

This subsection uses simple correlations and graphs to highlight the relationship between the initial size of the financial system and subsequent real per capita growth.

We again categorize countries as "very fast," "fast," "slow," and "very slow" and then compute the average initial values of the four financial size measures for the countries within each category. The results are presented in Table 2. For every measure of the initial size of the financial system, there is a noticeable pattern: countries that began the thirty year period with larger financial systems enjoyed faster subsequent growth. In addition, the correlation between the initial size of the financial system and growth is strong. The

¹⁰ The very fast, fast, slow, very slow categories have the same initial number of observations, but missing financial data imply that the categories in Table 1 do not have the same number of observations.

Pearson Correlation Coefficient, is significantly positive at the 0.01 level for each of the measures of initial financial system size and growth.

D. Channels to Growth: Average and Initial Financial Size

This subsection presents correlations and graphs to illustrate the channels through which the average and initial financial size indicators may be correlated with growth. Specifically, we decompose growth into two components: the investment share and what is sometimes called the "efficiency of investment;" we then examine the correlations of the investment share and the efficiency of investment with the average and initial financial size indicators. Formally, let INV equal gross national investment divided by output; and let EFF equal the change in output divided by the change in the domestic capital stock. Thus, real per capita growth (GYP) may be defined as

$$GYP = INV * EFF, \text{ where}$$

$$GYP = \frac{\Delta \text{GDP per Capita}}{\text{GDP per Capita}},$$

$$INV = \frac{\text{Gross Domestic Investment}}{\text{GDP per Capita}},$$

$$EFF = \frac{\Delta \text{GDP per Capita}}{\text{Gross Domestic Investment}}, \text{ but}$$

to partially account for depreciation let

$$EFF = EFF \sim \frac{0.1(1-INV)}{INV}, \text{ so that}$$

$$EFF = \frac{\Delta \text{GDP per Capita}}{\Delta \text{Capital Stock}}.$$

It must be recognized, however, that the cross-country correlation between the average investment share (INV) and average efficiency of investment measure (EFF) over the 1960-89 period is positive, 0.42, and significant at the 0.01 level. Thus, the very simple decompositions performed in this paper may not fully isolate the channels through which domestic financial market activity and

growth are linked. Thus, this paper's efforts should be viewed as an initial attempt to better document the empirical linkages between measures of domestic financial market activity and long-run growth.¹¹

Tables 3-6 give the correlations between the financial size indicators and both the investment share, INV, and the "efficiency of investment," EFF. The simple bi-variate correlations between each of the average and initial financial size indicators and both the investment share and efficiency of investment are significant at the 0.01 level. Thus, the simple correlations between growth and the financial size indicators seems to run through both the "investment" and "efficiency" channels.

*E. Cross-Country Regressions*¹²

This subsection presents some simple regressions to gauge whether the correlation between the financial size indicators and growth remain significant after controlling for other variables. We regress average annual per capita growth rates on measures of domestic financial market size and variables that are commonly included in cross-country growth regressions [see: Levine and Renelt 1990, 1991]. We average the data over the 1960-89 period. There are three main results. First, for a large number of econometric specifications, both the average size of the financial system and measures of the initial size of the financial system enter positively and significantly. Second, when common indicators of monetary, fiscal, and trade policy are simultaneously included in the regression, the initial financial size variable frequently becomes insignificant at the 0.05 level. Finally, the average size of the financial system is correlated with both the component of growth correlated with the investment share and the component of growth uncorrelated with the investment

¹¹ Note, the results are basically identical when using EFF or the non-depreciated version of EFF given in equation (1).

¹² In the regressions we report the result using quasi-liquid-liabilities (QLLY) as a measure of size. The results are very similar with LLY.

share. The initial financial system size indicator, however, is most strongly correlated with the efficiency of investment, not the level of investment.

Table 7 presents the results from six regressions. The first is a baseline regression of per capita growth (GYP) on a constant, the initial level of real per capita income (RGDP60), the initial secondary school enrollment rate (SEC), and dummy variables for Africa (AFRICA) and Latin America (LAAM). These "core" variables all enter with significant coefficients, and only the constant and the initial secondary school enrollment rate have positive coefficients. These results conform with those in Barro (1991) and Levine and Renelt (1991). The second regression adds the average ratio of quasi-liquid liabilities to GDP (QLLY). The coefficient on QLLY is positive and enters with a t-statistic of 4.42. The strongly significant continent dummies - common in cross-country regressions - suggest that this specification is missing important explanatory variables. Nonetheless, regression (2) does imply that the partial correlation between growth and the average size of the financial system remains strong even when controlling for commonly included variables.

Regression equation (3) in Table 7 further demonstrates that even after controlling for some other policy indicators: the ratio of trade to GDP (TRADE), the ratio of government spending to GDP (GOV), and the average annual inflation rate (INFLATION), the average size of the financial system (QLLY) remains positively and significantly correlated with growth at the 0.01 significance level. One should also note that the continent dummies remain significant; this emphasizes the difficulties in explaining cross-country variations in long-run growth rates.

Regressions (4) - (7) explore the channels through which the average size of the financial system size and growth are correlated. In regressions (4) and (5) the dependent variable is our measure of the efficiency of investment. Although the average financial size indicator is significantly correlated with growth in a simple regression that includes the core variables, the partial correlation between efficiency and average financial size becomes insignificant when the regression includes measures of fiscal, monetary, and trade policy. In

regressions (6)-(7), the dependent variable is the average ratio of gross investment to GDP over the 1960-89 period. Regressions (6)-(7) indicate that the investment share is significantly correlated with the average size of the financial system after controlling for the core and policy variables. Thus, using data averaged over the 1960-89 period, the average financial size indicator is related to growth via both the investment and the efficiency channel, but the link through the investment channel is more robust with respect to other policy indicators.

Table 8 presents the same set of regressions as in Table 7 using the initial size of the financial system (QLLY60). The results using the initial size of the financial system are similar to, though not as strong as, the results using average financial system size. After controlling for initial income, initial secondary school enrollment rates, and after including dummy variables for Africa and Latin America, the initial size of the financial system enters positively with a t-statistic of 3.05. After including indicators for monetary, fiscal, and trade policies, the t-statistic on the initial size of the financial system falls to 1.84, which has a P-value of 0.07.¹³ As regressions (4) - (6) indicate, it is very difficult to isolate the channel via which the initial size of the financial system and growth are linked. The initial financial size indicator is insignificantly correlated with both the investment share and the efficiency of investment.

The cross-country regression results indicate that the partial correlations between growth and both average financial size and initial financial size remain significant after controlling for a core set of commonly included variables. For the average financial size - but not for the initial financial size indicator, the partial correlation with growth remains significant (at the 0.05 level) when additional policy indicators are included in the regression. Furthermore, the

¹³ The results over the 1974-89 are weaker. Although the average and initial policy size indicators enter significantly in the regression that excludes TRADE, GOV, INFLATION, the financial size measures become insignificant when these policy indicators are included even at the 0.10 level.

average financial size indicator is related to growth through both the investment and efficiency channels

F. Pooled Cross-Country, Time-Series Regressions

Table 9 presents pooled cross-country, time-series regression results using the average financial size indicator. The observations are annual data averaged over five intervals during the 1960-89 period for as large a cross-section of countries as possible. Thus, each country has one observation for the 1960-1964 period, another for the 1965-1969 period, etc.

Regression (1) is the baseline regression where the variables are as defined above except that RGDPi is the initial value of real GDP per capita for each of the six five year periods.¹⁴ The results in regressions (2)-(4) indicate that the pooled results are importantly different from the averaged cross-section results of tables 7 and 8. The average size of the financial system does not enter with a significant coefficient. More interestingly, however, regression (3) shows that the average size of the financial system is negatively and significantly correlated with the efficiency part of growth, but regression (4) shows that the average financial size indicator is positively and significantly correlated with the investment share. Thus, the average financial size indicator is positively related to growth via the investment channel but negatively related to growth via the efficiency channel. These results do not change if one uses the initial size of the financial system (for each five year period) or if one excludes the measures fiscal, monetary, and trade performance.

III. Financial Institutions & Growth

This section examines the relationship between growth and the relative importance of different financial institutions. For the broad set of countries

¹⁴ The initial secondary school enrollment rate for each five year period is not included because it is difficult to obtain comparable data for a large number of countries for each five year interval. When we used data from disparate sources, the main results in this paper did not change.

that we are studying, the only institutional break-down that can be made is between the central bank and deposit money banks. Consequently, this section analyzes whether there is a close association between long-run growth and the relative size of deposit money banks.

A. Measures of Institutional Importance

We use three measures to analyze the relative importance of commercial banks and central banks:

CBY: The Ratio of Central Bank Domestic Assets to GDP. (IFS lines 12a+12b+12c+12d+12e+12f divided by GDP)

BY: The Ratio of Deposit Money Banks Domestic Assets to GDP. (IFS lines 22a+22b+22c+22d+22e+22f divided by GDP)

BTOT: The Ratio of Deposit Money Banks Domestic Assets to Deposit Money Bank plus Central Bank Domestic Assets.

B. Institutional Importance and Growth

Table 10 highlights the importance of deposit banks relative to central banks. Again, we categorize countries as very fast, fast, slow, and very slow growers over the 1960-89 period. We then compute the average ratio of central bank domestic assets to GDP, the average ratio of deposit money bank domestic assets to GDP, and the average ratio of deposit bank assets to deposit bank plus central bank assets. There are three results: (1) faster growing countries tend to have larger ratios of deposit bank assets to GDP than slower growing countries; (2) faster growing countries tend to have larger deposit banks relative to central banks than slower countries; and (3) there is weak, negative correlation between central bank size as a share of GDP and growth.

C. Channels to Growth: Financial Institutions

Tables (11) - (12) document the simple correlations between the financial institution measures and both the average ratio of investment to GDP (INV) and the average ratio of the change in GDP to investment (EFF). The tables indicate that both the share of deposit bank domestic credit to GDP (BY) and the share of

deposit bank domestic credit to deposit bank plus central bank domestic credit (BTOT) are positively and significantly correlated with the investment share (INV) and the efficiency of investment (EFF). Using simple bi-variate comparisons, measures of deposit bank importance are linked to growth via both the investment and efficiency channels. The ratio of central bank domestic credit to GDP, however, is negatively though insignificantly correlated with INV and EFF.

D. Cross-Country Regression Analysis

This section presents cross-country regression results to gauge the relationship between growth and the relative importance of different financial institutions. In particular, we use BTOT - the ratio of deposit money bank domestic assets to deposit money bank plus central bank domestic assets as an indicator of the importance of deposit banks relative to the central bank.

Table 13 presents the regressions results for the 1960-89 period. Regression (1) is a baseline regression using the core variables: initial income (RDGP60), initial human capital (SEC), and continent dummies for Africa and Latin America. Regression (2) demonstrates that after controlling for the core variables the measure of deposit bank importance (BTOT) remains positively and significantly correlated with the average annual per capita growth rate over the 1960-89 period. Indeed, after including indicators for monetary, fiscal, and trade performance, the coefficient on BTOT remains positive and significant at the 0.01 level [regression (3)]. These results suggest that the partial correlation between growth and the size of deposit banks relative to the central bank remains strong while controlling for other policies.

Regressions (4)-(6) in Table 13 suggest that the relationship between growth and the measure of deposit bank importance runs through the investment share. BTOT is insignificantly correlated with the average efficiency of investment.¹⁵ BTOT is, however, positively and significantly correlated with

¹⁵ This finding is unchanged when the regression includes other policy indicators.

the investment share after controlling for the core variables and monetary, fiscal, trade policy indicators.¹⁶ Thus, the simple regressions in this subsection suggest that faster growing countries tend to have financial systems where deposit banks play a relatively larger role than central banks, and the linkages between deposit bank importance and growth seem to run primarily through the share of resources devoted to investment.

E. Pooled Cross-Country, Time-Series Regressions

Table 14 presents pooled cross-country, time-series regressions using the financial indicator BTOT - the ratio of deposit bank domestic assets to deposit bank plus central bank domestic assets. As in the simple cross-country regressions, BTOT is significantly correlated with growth in the pooled regressions after including measures of fiscal, monetary, and trade performance. But, the pooled regressions (2)-(3) in table 14 also demonstrate that the indicator of deposit bank importance is related to growth via both the investment and efficiency channels: BTOT is positively and robustly correlated with the efficiency of investment, and BTOT is positively and robustly correlated with the investment share.

IV. The Distribution of Financial System Assets & Growth

This section analyzes whether the asset distribution of the financial system is related to long-run growth. Due to data limitations, the question becomes: do faster growing countries tend to be countries in which financial intermediaries allocate a higher proportion of assets to the non-financial private sector?

¹⁶ Regression (7) also includes QLLY, which demonstrates that the link between BTOT and INV remains significant even after including other financial indicators. When QLLY is excluded BTOT retains its significance.

A. Measure of Asset Distribution by the Financial System

The measure of asset distribution is

DCPT: The Ratio of Claims on the Non-Financial Private Sector by the Central Bank and Deposit Money Banks to total Domestic Credit. (IFS line 32d divided by lines 32d+32a+32b+32c+32f)

The ratio of claims on the non-financial private sector by major financial institutions to total claims by these institutions represents a broad indicator of the importance of asset distribution.¹⁷ One might expect that in faster growing countries, the financial system would allocate a higher percentage of credit to private enterprises as opposed to the government, public enterprises, or the central bank. It should be noted, however, that DCPT may simply be an indicator of the relative size of the private sector and not an indicator of financial sector performance in any meaningful way.¹⁸

B. Institutional Asset Distribution and Growth

As Table 15 illustrates, the correlation between the share of domestic credit allocated to the private sector (DCPT) and per capita growth (GYP) is 0.39 and is significant at the 0.01 level: countries with faster growth rates over the 1960-89 period tended to have financial systems that allocated a larger percentage of domestic assets to the private sector.¹⁹

C. Channels to Growth: Asset Distribution

Tables 16 and 17 show that the share of credit allocated to the private sector by the financial system is positively and significantly correlated with both the investment rate (INV) and the efficiency of investment (EFF). Thus,

¹⁷ Recall, Section I demonstrated the close association between growth and the ratio of total claims on the private sector to GDP.

¹⁸ We would like to thank Dan Mozes for pointing this out to us.

¹⁹ The correlation over the 1974-89 period is similar (0.36) and also significant at the 0.01 level.

using simple bi-variate comparisons, asset distribution by the domestic financial system is related to growth via both the investment and efficiency channels.

D. Cross-Country Regression Analysis

Table 18 presents cross-country growth regressions to document further the relationship between growth and the allocation of financial assets by the financial system. The first regression presents the baseline regression with the core variables. Regression (2) indicates that the partial correlation between growth and the distribution of domestic assets between the non-financial private sector and other sectors remains significant after controlling for initial income, the initial secondary school enrollment rate, and the continent dummy variables. Regression (3) demonstrates that the partial correlation between growth and the share of domestic credit allocated to the private sector (DCPT) by the financial system remains positive and significant even after including indicators for trade, fiscal, and monetary policy.

Regressions (4)-(5) indicate that the share of domestic credit allocated to the private sector by the financial system (DCPT) is linked to growth primarily through the "investment channel." Specifically, DCPT is not significantly correlated with our measure of investment efficiency - the ratio of the change in GDP to gross domestic investment. DCPT is, however, significantly correlated with the investment share after controlling for the core and policy variables.

E. Pooled Cross-Country Regressions: Asset Distribution Indicator

The pooled cross-country, time-series regressions in table 19 support the views that (1) the distribution of domestic assets between the private and non-private sectors is importantly correlated with growth and (2) this partial correlation remains significant when other policy indicators are included in the regression. Furthermore, the pooled regressions show that the ratio of domestic credit allocated to the private sector by the financial system (DCPT) is positively and significantly correlated with growth through both the investment

and efficiency channels. Thus, in contrast to the simple cross-country regressions, the pooled regressions suggest that the share of credit allocated to the private sector is linked to growth through both channels.

F. Cross-Country Regressions: Size, Institution, and Asset Indicators

Tables 20 and 21 present regressions using data averaged over the 1960-89 period that simultaneously include more than one financial indicator. Table 20 regression (1) indicates that when the ratio credit allocated to the private sector is included with the ratio of deposit bank to total domestic credit, neither financial indicator enters as independently significant, but they do enter as jointly significant. When using cross-country data averaged over the 1960-89 period, regressions (2)-(4) suggest once again that the link between measures of the financial system and growth tends to run through the investment share and not the efficiency of investment. The two financial indicators are jointly significantly correlated with investment but not with the average efficiency of investment. Table 21 further illustrates that it is difficult to isolate the independent relationship between any one financial indicator and growth once other financial indicators are included. A notable exception, however, is that our indicator of deposit bank importance relative to central banks is correlated with the investment share after controlling for the average size of the financial system and the ratio of credit allocated to the private sector by the financial sector.

G. Pooled Cross-Country, Time-Series Regressions:

Size, Institution, and Asset Indicators

Tables 22 and 23 present regressions using pooled cross-country, time-series data to shed additional light on (1) the channels linking growth with the financial indicators and (2) whether information concerning the size of the financial system, the specific institutions performing intermediary services, and the recipients of credit by the financial system have independent explanatory power for growth.

The pooled regressions in table 22 emphasize that the measure of deposit bank importance (BTOT) and the measure of asset distribution to the private sector by the financial system (DCPT) are jointly, significantly correlated with growth through the investment and efficiency channels. Indeed, BTOT and DCPT each enter significantly in the simple regression of growth on initial real GDP per capita in each five year period (RGDPI), the dummy variables for Africa and Latin America, BTOT, and DCPT.

Table 23 presents regression results that include three financial indicators simultaneously: average financial system size (QLLY), bank importance (BTOT), and asset distribution to the private sector (DCPT). Taken together, BTOT and DCPT are positively and significantly correlated with growth through both the investment and efficiency channels even after including measures of fiscal, monetary, and trade performance and average financial system size. But, QLLY is negatively and significantly correlated with the efficiency of investment. QLLY is, however, positively and significantly correlated with the investment share. Thus, there is some evidence that once we account for which intermediaries are conducting financial intermediary services and to whom the financial system is allocating credit, overall financial system size is negatively related to the efficient use of resources but positively related to the share of resources devoted to investment.

V. Interest Rates & Growth

This section examines the empirical ties between interest rates and growth. Due to the availability of interest rate data, this analysis is only conducted over the 1974-89 period.

A. Measures of Interest Rate Repression and Financial Efficiency

The measures that we use to gauge (1) whether interest rates are severely repressed, and (2) the efficiency of financial intermediation are respectively

REPINT: The repressed interest rate variable, REPINT, takes on the value 1 if ex post real interest rates averaged less than -5.0 during the 1974 period and 0 otherwise. (IFS line 601)

FINEFF: The difference between the lending rate and the deposit rate (IFS line 60p minus line 60l)

The literature on the relationship between financial and economic development typically argues that the repression of interest rates interferes with efficient financial intermediation. As in Easterly (1990) and Roubini and Sala-i-Martin (1991), we construct a dummy variable that isolates countries with "extremely" low real interest rates (REPINT). In this way, we hope to identify those countries that have severely repressed their interest rates over the 1974-89 period.

In addition, we attempt to use interest rate data to gauge the efficiency with which the financial system intermediates between savers and investors. Thus, we examine the spread between lending and borrowing rates as a measure of financial efficiency (FINEFF). The relatively poor nature of interest rate data and the potential problems in making comparisons of these data across countries, however, shed doubt on the reliability of this financial efficiency index.²⁰

C. Some Correlations and Comparisons

Although the correlation between average real per capita growth from 1974-89 and our financial efficiency index, FINEFF, is negative (-0.12), it is insignificant (P-value=0.29).

Table 24-A presents the average real interest rates over the 1974-89 period for very fast, fast, slow and very slow growers. Although there is clear pattern

²⁰ For example, cross-country differences in regulations regarding loan loss reserves could alter the spread between deposit and lending rates without necessarily representing cross-country differences in financial efficiency.

that slower growing countries tend to have lower real interest rates, the correlation is insignificant at the 0.05 level.

Table 24-B demonstrates that countries with average real interest rates below -0.5 over the 1974-89 period tended to grow more slowly than countries with average real interest rates greater than -0.5. This generally supports the findings of Gelb (1989), Easterly (1990), and Roubini and Sala-i-Martin (1991) that severely repressed interest rates are associated with slow growing countries. Furthermore, countries with severely depressed interest rates tend to have low investment rates and low efficiency of investment measures.

D. Regression Results

The regression results indicate that the relationship between severe interest rate repression and growth does not remain strong when the regression includes other policy variables. Regression (2) in Table 25 shows that the repressed interest rate dummy variable (REPINT) enters with a negative coefficient that has a P-value of 0.05. When the policy indicators TRADE, GOV, and INFLATION, measured over the 1974-89 period, are included in regression (3), the coefficient on REPINT becomes more negative, but the P-value rises to 0.11. Interestingly, the relationship between REPINT and growth seems to run primarily through the efficiency of investment as evinced in regressions (4)-(5). Regression (5) shows that the negative partial correlation between the investment efficiency and the severely negative real interest rate variable remains negative and significant when the regression includes indicators for fiscal, monetary, and trade performance.

VI. Conclusions

This paper examined the empirical relationship between a host of financial system indicators and long-run growth. Four broad findings emerge:

(1) Many financial indicators are significantly correlated with growth. The initial size of the financial system in 1960 is significantly correlated with growth over the next 30 years. Long-run growth is significantly correlated with the average size of the financial system over the 1960-89 period, the fraction of credit allocated by deposit banks, the percentage of assets allocated to private enterprises by the financial system, and measures of severely repressed interest rates.

(2) Some financial indicators - the average size of the financial system, the relative importance of deposit banks, and the percentage of assets distributed to the private sector - remain significantly correlated with growth in cross-country regressions that control for initial income, initial human capital, dummy variables for countries in Sub-Saharan Africa and Latin America, and measures of trade, fiscal, and inflation performance. Importantly, the measure of deposit bank performance and the measure of assets distributed to the private sector remain significantly correlated with growth even when measures of the overall size of the financial system are included.

(3) The financial indicators tend to corroborate each other in terms of their relationship with long-run growth in the simple cross-country regressions. The financial indicators are highly correlated with one another as depicted in Tables 26-27, and they are also all highly correlated with the ratio of international trade to GDP [Table 28]. Furthermore, the correlation between the financial indicators and other policy indicators suggests that future research must seriously consider the linkages between domestic financial policy and other national policies.

(4) In the cross-country regressions, those financial indicators that remain significantly correlated with growth after controlling for the core and policy variables tend to be strongly correlated with the investment share but not the efficiency of investment. However, the pooled cross-country, time-series regressions suggest that the financial indicators are linked through both the investment and efficiency channels: (a) the measure of deposit bank importance and the measure of asset distribution to the private sector by the financial system are positively and significantly correlated with growth through both the investment and efficiency channels after controlling for fiscal, monetary, and trade performance; and (b) there is some evidence that once one controls for which financial institutions are conducting intermediary services and to whom the financial system is allocating credit, overall financial size is negatively related to the efficient use of resources and positively related to the investment share.

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Appendix

Country List
119 Country Sample

1	AFG	Afghanistan	40	HTI	Haiti	80	PRY	Paraguay
2	DZA	Algeria	41	HND	Honduras	81	PER	Peru
3	AGO	Angola	42	HKG	Hong Kong	82	PHL	Philippine
4	ARG	Argentina	43	ISL	Iceland	83	PRT	Portugal
5	AUS	Australia	44	IND	India	84	RWA	Rwanda
6	AUT	Austria	45	IDN	Indonesia	85	SAU	Saudi Arab
7	BGD	Bangladesh	46	IRN	Iran	86	SEN	Senegal
8	BRB	Barbados	47	IRQ	Iraq	87	SLE	Sierra Leo
9	BEL	Belgium	48	IRL	Ireland	88	SGP	Singapore
10	BOL	Bolivia	49	ISR	Israel	89	SOM	Somalia
11	BWA	Botswana	50	ITA	Italy	90	ZAF	South Afri
12	BRA	Brazil	51	JAM	Jamaica	91	ESP	Spain
13	BDI	Burundi	52	JAP	Japan	92	LKA	Sri Lanka
14	CMR	Cameroon	53	JOR	Jordan	93	SDN	Sudan
15	CAN	Canada	54	KEN	Kenya	94	SWZ	Swaziland
16	CAF	Cent. Afr. Rep	55	KOR	Korea	95	SWE	Sweden
17	TCD	Chad	56	KWT	Kuwait	96	CHE	Switzerlan
18	CHL	Chile	57	LSO	Lesotho	97	SYR	Syria
19	COL	Colombia	58	LBR	Liberia	98	OAN	Taiwan
20	COG	Congo	59	LUX	Luxembourg	99	TZA	Tanzania
21	CRI	Costa Rica	60	MDG	Madagascar	100	THA	Thailand
22	CIV	Cote D'Ivoire	61	MWI	Malawi	101	TGO	Togo
23	CYP	Cyprus	62	MYS	Malaysia	102	TTO	Trin. and
24	DEN	Denmark	63	MLI	Mali	103	TUN	Tunisia
25	DOM	Dominican Rep.	64	MLT	Malta	104	TUR	Turkey
26	ECU	Ecuador	65	MRT	Mauritania	105	UGA	Uganda
27	EGY	Egypt	66	MUS	Mauritius	106	GBR	Great Brit
28	SLV	El Salvador	67	MEX	Mexico	107	USA	United Sta
29	ETH	Ethiopia	68	MAR	Morocco	108	URY	Uruguay
30	FJI	Fiji	69	MOZ	Mozambique	109	VEN	Venezuela
31	FIN	Finland	70	NLD	Netherland	110	YEM	Yemen
32	FRA	France	71	NZL	New Zealan	111	ZAR	Zaire
33	GAB	Gabon	72	NIC	Nicaragua	112	ZMB	Zambia
34	GMB	Gambia	73	NER	Niger	113	ZWE	Zimbabwe
35	DEU	Germany	74	NGA	Nigeria	114	BUR	Burma
36	GHA	Ghana	75	NOR	Norway	115	GUY	Guyana
37	GRC	Greece	76	OMN	Oman	116	BEN	Benin
38	GTM	Guatemala	77	PAK	Pakistan	117	HVO	Burkina Fa
39	GNB	Guinea-Bissau	78	PAN	Panama	118	NPL	Nepal
			79	PNG	Pap. New G	119	SUR	Suriname

Table 1
AVERAGE FINANCIAL SIZE AND GROWTH
 1960-1989

	Very Fast > 3.14	Fast ≥ 2.048, < 3.14	Slow ≥ 0.5374 < 2.048	Very Slow < 0.5374	Correlation with GYP (P-value)
M1Y	0.23	0.19	0.15	0.14	0.40 (0.001)
LLY	0.60	0.38	0.29	0.22	0.62 (0.001)
QLLY	0.37	0.20	0.15	0.07	0.64 (0.001)
DCPY	0.35	0.27	0.20	0.13	0.44 (0.001)
GYP	4.12	2.60	1.41	-0.29	
No. obs	22	23	24	23	

M1Y - M1 to GDP
 LLY - Liquid Liabilities to GDP
 QLLY- Quasi-Liquid liabilities to GDP
 DCPY- Gross Claims on private sector to GDP
 GYP - Real Per Capita Growth Rate

Average Financial Size and Growth
 1960-89

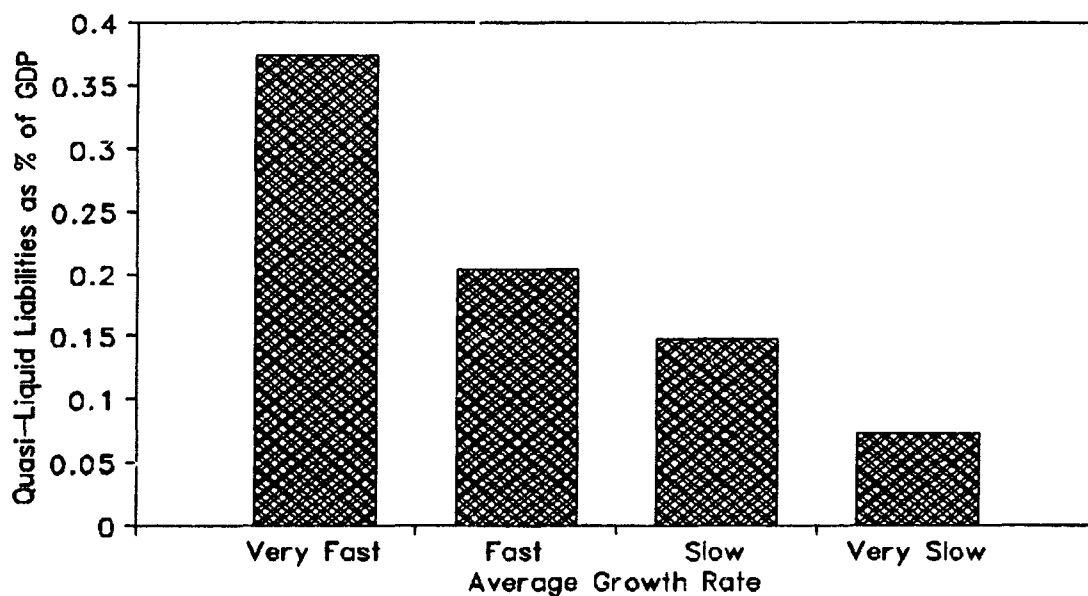


Table 2
INITIAL FINANCIAL SIZE & GROWTH
1960-1989

	Very Fast > 3.14	Fast ≥ 2.048, < 3.14	Slow ≥ 0.5374 < 2.048	Very Slow < 0.5374	Correlation with GYP (P-value)
M1Y60	0.23	0.22	0.17	0.10	0.47 (0.001)
LLY60	0.45	0.37	0.29	0.14	0.52 (0.001)
QLLY60	0.21	0.14	0.12	0.04	0.46 (0.001)
DCPY60	0.27	0.20	0.20	0.09	0.35 (0.005)
GYP	4.07	2.61	1.44	-0.03	
No. obs	19	20	12	12	

M1Y60 - M1 to GDP in 1960
LLY60 - Liquid Liabilities to GDP in 1960
QLLY60 - Quasi-Liquid liabilities to GDP in 1960
DCPY60 - Claims on the Private Sector to GDP in 1960
GYP - Real Per Capita Growth Rate

Initial Financial Size and Growth

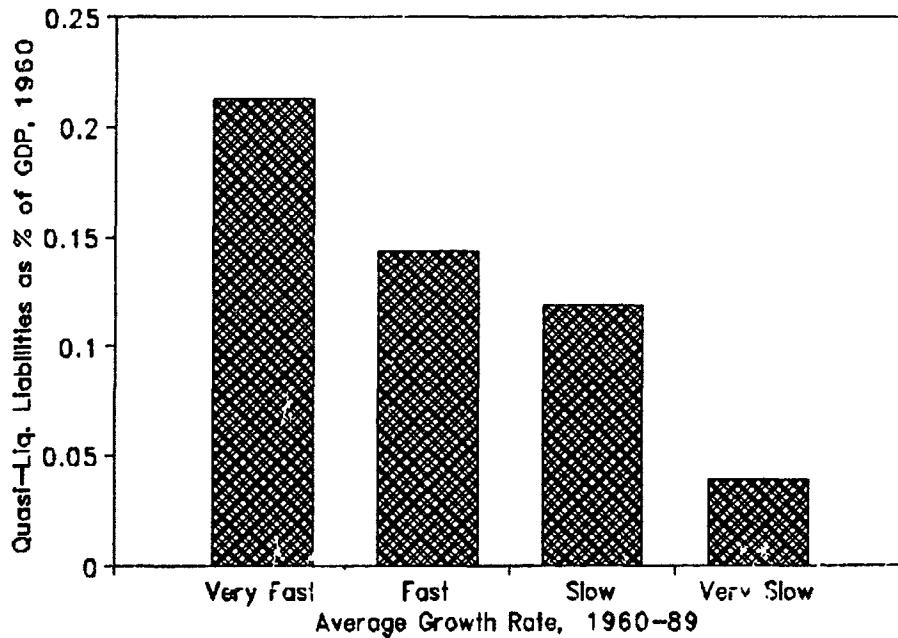


Table 3

AVERAGE FINANCIAL SIZE AND INVESTMENT

1960-89

	Very High ≥0.24	High ≥0.21 <0.24	Low ≥0.16 <0.21	Very Low <0.16	Correlation with INV (P-value)
M1Y	0.22	0.18	0.17	0.14	0.36 (0.004)
LLY	0.57	0.42	0.28	0.22	0.56 (0.001)
QLLY	0.35	0.25	0.11	0.08	0.57 (0.001)
DCPY	0.35	0.29	0.17	0.14	0.48 (0.001)
INV	0.27	0.22	0.19	0.13	
No. obs	27	23	26	24	

M1Y - M1 to GDP
 LLY - Liquid Liabilities to GDP
 QLLY - Quasi-Liquid Liabilities to GDP
 DCPY - Claims on the Private Sector to GDP
 INV - Annual Average Investment to GDP Ratio

Table 4

AVERAGE FINANCIAL SIZE AND EFFICIENCY

1960-89

	Very High ≥14.17	High ≥9.88 <14.17	Low ≥3.01 < 9.88	Very Low < 3.01	Correlation with EFF (P-value)
M1Y	0.23	0.19	0.15	0.14	0.30 (0.004)
LLY	0.56	0.41	0.30	0.21	0.48 (0.001)
QLLY	0.33	0.23	0.16	0.07	0.51 (0.001)
DCPY	0.32	0.29	0.21	0.13	0.34 (0.001)
EFF	18.54	12.38	7.34	-2.50	
No. obs	25	25	25	23	

M1Y - M1 to GDP
 LLY - Liquid Liabilities to GDP
 QLLY - Quasi-Liquid Liabilities to GDP
 DCPY - Gross Claims on the Private Sector to GDP
 EFF - Average Annual Efficiency of Investment

Table 5
INITIAL FINANCIAL SIZE AND INVESTMENT
1960-89

	Very High ≥0.24	High ≥0.21 <0.24	Low ≥0.16 <0.21	Very Low <0.16	Correlation with INV (P-value)
M1Y60	0.22	0.22	0.17	0.13	0.35 (0.004)
LLY60	0.43	0.39	0.24	0.18	0.41 (0.006)
QLLY60	0.22	0.16	0.07	0.06	0.37 (0.002)
DCPY60	0.28	0.24	0.11	0.12	0.42 (0.002)
INV	0.26	0.22	0.19	0.13	
No. obs	21	16	19	15	

M1Y60 - M1 to GDP in 1960
LLY60 - Liquid Liabilities to GDP in 1960
QLLY60 - Quasi-Liquid Liabilities to GDP in 1960
DCPY60 - Claims on the Private Sector to GDP in 1960
INV - Annual Average Investment to GDP Ratio 1960-89

Table 6
INITIAL FINANCIAL SIZE AND EFFICIENCY
1960-89

	Very High ≥14.17	High ≥9.88 <14.17	Low ≥3.01 < 9.88	Very Low < 3.01	Correlation with EFF (P-value)
M1Y60	0.26	0.20	0.17	0.10	0.41 (0.001)
LLY60	0.46	0.33	0.30	0.13	0.46 (0.001)
QLLY60	0.20	0.15	0.12	0.04	0.40 (0.001)
DCPY60	0.25	0.22	0.21	0.08	0.32 (0.008)
EFF	17.26	12.33	7.46	-1.75	
No. obs	18	22	15	14	

M1Y - M1 as a ratio to GDP in 1960
LLY - Liquid Liabilities as a ratio to GDP in 1960
QLLY - Quasi-Liquid Liabilities as a ratio to GDP in 1960
DCPY - Gross Claims on the Private Sector as a ratio to GDP in 1960
EFF - Average Annual Efficiency of Investment, 1960-89

Table 7

AVERAGE FINANCIAL SIZE AND GROWTH

1960 - 1989

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
dep. var.	GYP	GYP	GYP	EFF	EFF	INV	INV
obs.	85	85	85	85	85	85	85
constant	2.98 (8.19)	2.15 (5.70)	2.11 (4.11)	11.26 (5.36)	13.13 (4.18)	0.19 (12.42)	0.14 (6.97)
RGDP60	-0.43 (3.21)	-0.51 (4.17)	-0.45 (3.55)	-1.71 (2.51)	-1.45 (2.04)	-0.01 (1.18)	-0.01 (1.03)
SEC	3.56 (2.95)	2.55 (2.29)	2.57 (2.31)	10.23 (1.66)	10.57 (1.70)	0.02 (0.43)	0.01 (0.26)
AFRICA	-2.06 (5.02)	-1.46 (3.70)	-1.60 (3.97)	-7.12 (3.25)	-7.62 (3.40)	-0.02 (1.04)	-0.02 (1.62)
LAAM	-1.50 (3.96)	-0.92 (2.51)	-1.03 (2.49)	-4.18 (2.05)	-4.48 (1.94)	-0.001 (0.12)	-0.01 (0.42)
TRADE	--	--	0.85 (1.53)	--	2.73 (0.89)	--	0.06 (2.88)
GOV	--	--	-3.34 (0.98)	--	-19.28 (1.01)	--	0.12 (0.94)
INFLATION	--	--	-0.01 (0.70)	--	-0.01 (1.00)	--	0.01 (1.25)
QLLY	--	4.33 (4.42)	3.56 (3.32)	11.22 (2.06)	8.19 (1.37)	0.15 (3.82)	0.11 (2.83)
R-SQR	0.48	0.58	0.60	0.40	0.42	0.31	0.44

(t-statistics in parentheses)

Table 8

INITIAL FINANCIAL SIZE AND GROWTH

1960 - 1989

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
dep. var.	GYP	GYP	GYP	EFF	EFF	INV	INV
obs.	60	60	60	60	60	60	60
constant	3.48 (8.61)	3.09 (7.71)	3.26 (5.35)	14.0 (7.77)	15.89 (5.74)	0.21 (12.99)	0.19 (8.05)
RGDP60	-0.40 (3.04)	-0.53 (4.06)	-0.45 (3.27)	-1.65 (2.84)	-1.43 (2.30)	-0.01 (1.42)	-0.01 (0.57)
SEC	2.42 (1.93)	2.59 (2.21)	2.56 (2.19)	8.95 (1.70)	9.44 (1.78)	0.05 (1.03)	0.03 (0.76)
AFRICA	-2.19 (4.24)	-1.88 (3.82)	-1.95 (4.01)	-8.79 (3.97)	-8.89 (4.01)	-0.02 (1.13)	-0.02 (1.54)
LAAM	-2.03 (4.89)	-1.64 (4.01)	-1.74 (3.96)	-6.64 (3.61)	-6.78 (3.39)	-0.02 (1.11)	-0.03 (1.74)
TRADE	--	--	1.11 (1.70)	--	2.25 (0.76)	--	0.08 (3.29)
GOV	--	--	-4.78 (1.18)	--	-20.27 (1.10)	--	-0.11 (0.69)
INFLATION	--	--	-0.01 (1.15)	--	-0.01 (1.40)	--	0.01 (0.71)
QLLY60	--	3.41 (3.05)	2.31 (1.84)	9.08 (1.81)	6.34 (1.11)	0.09 (1.92)	0.02 (0.69)
R-SQR	0.50	0.57	0.61	0.49	0.53	0.20	0.35

(t-statistics in parentheses)

Table 9

AVERAGE FINANCIAL SIZE AND GROWTH

Five Year Averages: 1960 - 1989

	(1)	(2)	(3)	(4)	(5)	(6)
dep. var.	GYP	GYP	EFF	EFF	INV	INV
obs.	337	337	337	337	337	337
constant	3.43 (10.25)	4.67 (9.30)	15.78 (7.43)	24.30 (7.58)	0.22 (26.68)	0.17 (15.32)
RGDPI	-0.11 (1.97)	-0.03 (0.41)	-0.58 (1.63)	-0.08 (0.19)	0.002 (1.70)	-0.001 (1.06)
AFRICA	-2.81 (7.09)	-2.79 (6.90)	-13.20 (5.24)	-13.21 (5.13)	-0.02 (2.34)	-0.03 (2.93)
LAAM	-2.40 (6.35)	-2.54 (6.53)	-11.05 (4.62)	-11.91 (4.79)	-0.02 (2.30)	-0.02 (2.71)
TRADE	--	1.22 (2.33)	--	3.42 (1.03)	--	0.10 (8.50)
GOV	--	-12.47 (4.14)	--	-62.70 (3.26)	--	-0.07 (1.12)
INFLATION	--	-0.01 (2.21)	--	-0.03 (2.07)	--	0.01 (1.21)
QLLY	--	-0.82 (0.86)	--	-9.33 (1.53)	--	0.08 (3.64)
R-SQR	0.17	0.23	0.10	0.14	0.06	0.32

(t-statistics in parentheses)

Table 10
FINANCIAL INSTITUTIONS AND GROWTH
1960-1989

	Very Fast >3.14	Fast ≥2.05 < 3.14	Slow ≥0.54 < 2.05	Very Slow <0.54	Correlation with GYP (P-value)
CBY	0.11	0.10	0.10	0.12	-0.12 (0.271)
BY	0.46	0.33	0.24	0.17	0.55 (0.001)
BTOT	0.81	0.73	0.71	0.60	0.46 (0.001)
GYP	3.87	2.61	1.41	-0.40	
No. obs	20	24	23	20	

CBY - Average ratio of Central Bank domestic credit to GDP
 BY - Average ratio of Deposit Money Bank domestic credit to GDP
 BTOT- Average ratio of Deposit Bank domestic credit to Deposit Bank plus
 Central Bank domestic assets
 GYP - Real Per Capita Growth Rate

Ratio of Bank Credit to Total Credit
1960-89

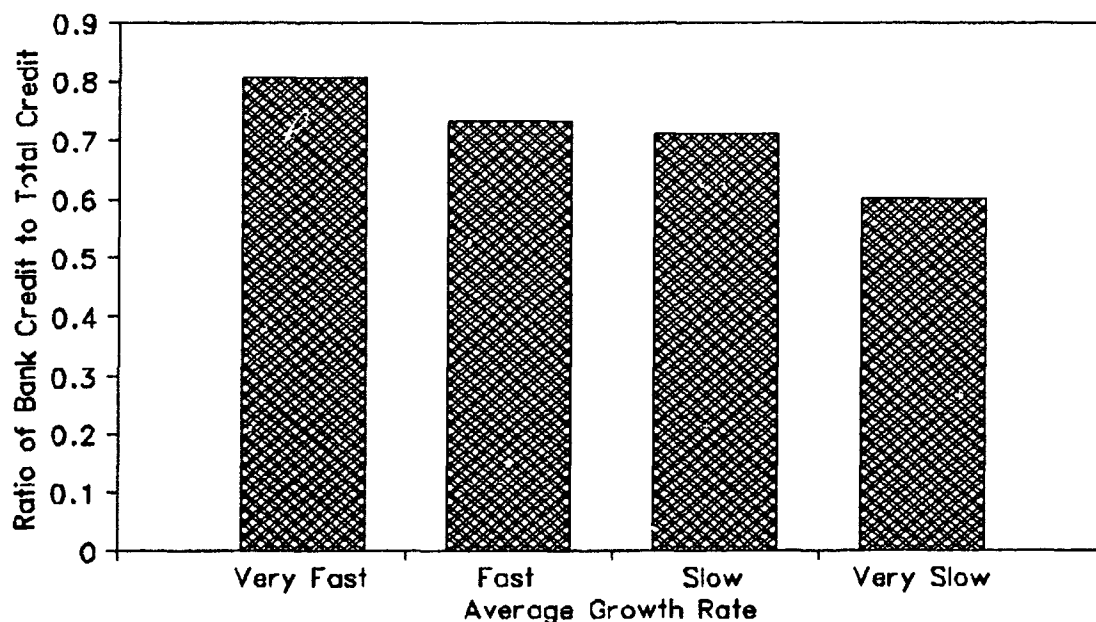


Table 11
FINANCIAL INSTITUTIONS AND INVESTMENT
 1960-89

	Very High ≥0.24	High ≥0.21 <0.24	Low ≥0.16 <0.21	Very Low <0.16	Correlation with INV (P-value)
CBY	0.10	0.09	0.13	0.12	-0.08 (0.464)
BY	0.43	0.34	0.25	0.14	0.55 (0.001)
BTOT	0.82	0.77	0.68	0.55	0.56 (0.001)
INV	0.27	0.22	0.19	0.13	
No.obs	23	22	21	20	

CBY - Average ratio of Central Bank Domestic Credit to GDP
BY - Average ratio of Deposit Money Bank Domestic Credit to GDP
BTOT - Average ratio of Deposit Money Bank Domestic Credit to
 Deposit Bank plus Central Bank Domestic Credit
INV - Average Annual Investment to GDP Ratio

Table 12
FINANCIAL INSTITUTIONS AND EFFICIENCY
 1960-89

	Very High ≥14.17	High ≥9.88 <14.17	Low ≥3.01 < 9.88	Very Low < 3.01	Correlation with EFF (P-value)
CBY	0.11	0.10	0.09	0.12	-0.08 (0.448)
BY	0.41	0.39	0.24	0.17	0.43 (0.001)
BTOT	0.75	0.78	0.72	0.60	0.36 (0.001)
EFF	17.38	12.40	7.34	-2.98	
No.obs	20	19	25	21	

CBY - Central Bank Domestic Credit to GDP
BY - Deposit Money Bank Domestic Credit to GDP
BTOT - Deposit Money Bank Domestic Credit to total Domestic Credit
EFF - Average Annual Efficiency of Investment

Table 13

FINANCIAL INSTITUTIONS AND GROWTH

1960 - 1989

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
dep. var.	GYP	GYP	GYP	EFF	EFF	INV	INV
obs.	76	76	76	76	76	76	76
constant	2.73 (7.41)	0.89 (1.23)	1.38 (1.66)	8.16 (2.04)	10.78 (2.33)	0.09 (3.44)	0.09 (3.10)
RGDP60	-0.41 (3.10)	-0.53 (3.98)	-0.48 (3.41)	-1.74 (2.36)	-1.52 (1.95)	-0.01 (2.04)	-0.01 (1.98)
SEC	3.91 (3.26)	3.65 (3.19)	3.56 (3.06)	13.00 (2.04)	12.78 (1.97)	0.05 (1.20)	0.01 (0.24)
AFRICA	-1.79 (4.30)	-1.69 (4.26)	-1.75 (4.27)	-7.52 (3.41)	-7.69 (3.37)	-0.02 (1.72)	-0.02 (1.62)
LAAM	-1.41 (3.59)	-1.18 (3.07)	-1.33 (3.00)	-4.90 (2.30)	-5.32 (2.15)	-0.01 (0.38)	-0.01 (0.64)
TRADE	--	--	0.56 (0.82)	--	1.77 (0.47)	--	0.05 (2.36)
GOV	--	--	-4.28 (1.18)	--	-21.65 (1.07)	--	0.12 (0.97)
INFLATION	--	--	-0.01 (0.06)	--	-0.008 (0.41)	--	0.01 (2.11)
BTOT	--	2.84 (2.93)	2.57 (2.29)	6.96 (1.29)	6.28 (1.01)	0.18 (5.21)	0.09 (2.23)
QLLY	--	--	--	--	--	--	0.11 (2.18)
R-SQR	0.49	0.53	0.54	0.36	0.37	0.42	0.53

(t-statistics in parentheses)

Table 14
FINANCIAL INSTITUTIONS AND GROWTH
Five Year Averages: 1960 - 1989

	(1)	(2)	(3)	(4)	(5)	(6)
dep. var.	GYP	GYP	EFF	EFF	INV	INV
obs.	337	337	337	337	337	337
constant	0.47 (0.74)	1.90 (2.63)	1.32 (0.32)	8.67 (1.86)	0.12 (7.79)	0.11 (7.22)
RGDPI	-0.27 (4.31)	-0.21 (3.31)	-1.34 (3.37)	-1.08 (2.67)	-0.003 (2.04)	-0.002 (1.49)
AFRICA	-2.74 (7.18)	-2.56 (6.77)	-12.85 (5.22)	-11.46 (4.68)	-0.02 (2.27)	-0.03 (3.67)
LAAM	-2.05 (5.55)	-2.06 (5.49)	-9.34 (3.93)	-8.83 (3.64)	-0.01 (1.06)	-0.02 (2.52)
TRADE	--	0.15 (0.29)	--	-3.09 (0.92)	--	0.09 (7.47)
GOV	--	-10.35 (3.53)	-	-50.36 (2.65)	--	-0.04 (0.63)
INFLATION	--	-0.01 (2.04)	--	-0.03 (1.88)	--	0.00 (1.38)
BTOT	4.61 (5.33)	4.51 (4.95)	22.51 (4.04)	24.57 (4.16)	0.16 (7.81)	0.10 (5.05)
R-SQR	0.24	0.28	0.14	0.18	0.21	0.34

(t-statistics in parentheses)

Table 15

DOMESTIC ASSET DISTRIBUTION AND GROWTH

1960-89

	Very Fast >3.14	Fast >2.05 <3.14	Slow >=0.54 < 2.05	Very Slow <0.54	Correlation with GYP (P-value)
DCPT	0.70	0.56	0.61	0.51	0.39 (0.003)
GYP	3.90	2.61	1.41	-0.40	
No. obs	19	21	23	20	

DCPT - Claims on the Non-Financial Private Sector to Total Domestic Credit

GYP - Annual average real per capita growth rate

Share of Credit Alloc.to Private Sector 1960-89

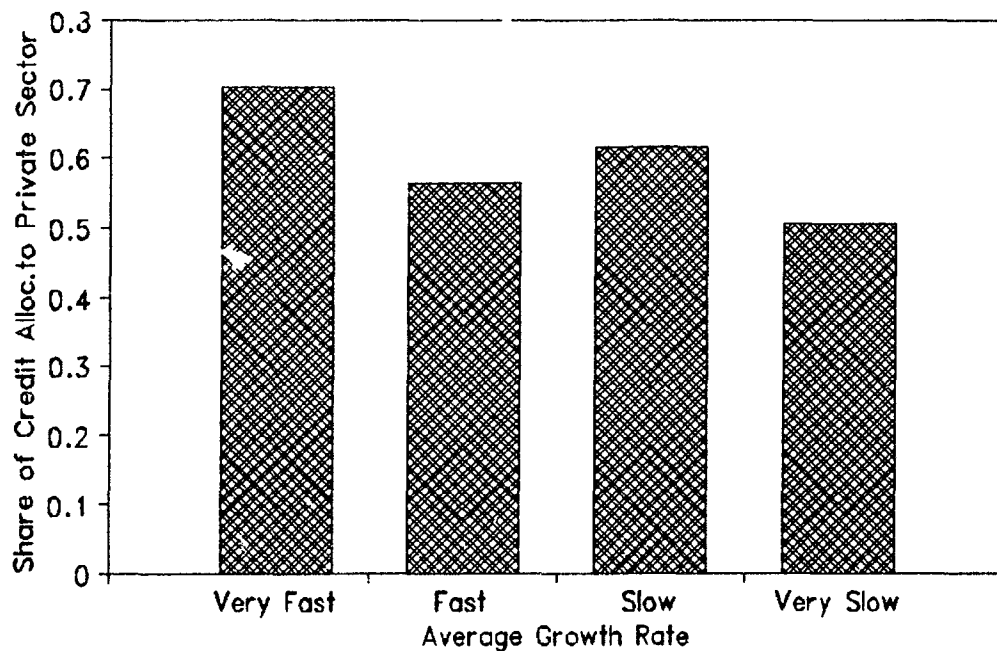


Table 16
DOMESTIC ASSET DISTRIBUTION AND INVESTMENT
 1960-89

	Very High ≥0.24	High ≥0.21 < 0.24	Low ≥0.16 < 0.21	Very Low <0.16	Correlation with INV (P-value)
DCPT	0.70	0.63	0.53	0.48	0.47 (0.001)
INV	0.27	0.22	0.19	0.13	
No.obs	21	23	21	20	

DCPT - Claims on the Non-Financial Private Sector to Total Domestic Credit
 INV - Annual average of investment as a ratio of GDP

Table 17
DOMESTIC ASSET DISTRIBUTION AND EFFICIENCY
 1960-89

	Very High ≥14.17	High ≥9.88 <14.17	Low ≥3.01 < 9.88	Very Low < 3.01	Correlation with EFF (P-value)
DCPT	0.62	0.64	0.62	0.50	0.28 (0.011)
EFF	17.38	12.35	7.34	-3.09	
No.obs	20	18	25	20	

DCPT - Claims on the Non-Financial Private Sector to Total Domestic Credit
 EFF - Average Annual Efficiency of Investment

Table 18
DOMESTIC ASSET DISTRIBUTION AND GROWTH
1960 - 1989

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
dep. var.	GYP	GYP	GYP	EFF	EFF	INV	INV
obs.	75	75	75	75	75	75	75
constant	2.74 (7.36)	1.39 (2.43)	1.81 (2.54)	9.51 (3.12)	11.78 (3.11)	0.14 (6.71)	0.11 (4.30)
RGDP60	-0.41 (3.03)	-0.52 (3.91)	-0.45 (3.29)	-1.64 (2.30)	-1.39 (1.83)	-0.007 (1.40)	-0.01 (1.40)
SEC	3.93 (3.23)	3.58 (3.09)	3.33 (2.84)	12.35 (1.93)	11.71 (1.79)	0.04 (0.97)	0.03 (0.80)
AFRICA	-1.79 (4.27)	-1.82 (4.57)	-1.90 (4.72)	-7.95 (3.65)	-8.12 (3.62)	-0.03 (1.89)	-0.04 (2.85)
LAAM	-1.42 (3.57)	-1.44 (3.82)	-1.65 (3.82)	-5.19 (2.52)	-5.57 (2.35)	-0.02 (1.33)	-0.03 (2.15)
TRADE	--	--	0.92 (1.47)	--	2.21 (0.66)	--	0.07 (3.27)
GOV	--	--	-5.66 (1.43)	--	-22.62 (1.06)	--	0.07 (0.49)
INFLATION	--	--	-0.01 (0.17)	--	-0.01 (0.41)	--	0.01 (2.12)
DCPT	--	2.71 (3.00)	2.51 (2.63)	6.49 (1.37)	6.03 (1.18)	0.13 (4.00)	0.11 (3.28)
R-SQR	0.47	0.53	0.55	0.35	0.36	0.31	0.48

(t-statistics in parentheses)

Table 19

DOMESTIC ASSET DISTRIBUTION AND GROWTH

Five Year Averages: 1960 - 1989

	(1)	(2)	(3)	(4)	(5)	(6)
dep. var.	GYP	GYP	EFF	EFF	INV	INV
obs.	337	337	337	337	337	337
constant	1.44 (2.96)	2.80 (4.59)	6.85 (2.17)	15.09 (3.80)	0.17 (14.11)	0.13 (10.00)
RGDPI	-0.24 (4.10)	-0.18 (2.93)	-1.18 (3.05)	-0.82 (2.08)	-0.001 (0.75)	-0.001 (1.09)
AFRICA	-2.89 (7.57)	-2.75 (7.26)	-13.52 (5.48)	-12.45 (5.05)	-0.02 (2.65)	-0.03 (4.18)
LAAM	-2.38 (6.57)	-2.44 (6.65)	-10.96 (4.67)	-10.93 (4.58)	-0.02 (2.35)	-0.03 (3.63)
TRADE	--	0.60 (1.21)	--	-0.22 (0.07)	--	0.10 (8.72)
GOV	--	-10.27 (3.48)	--	-51.68 (2.69)	--	-0.04 (0.59)
INFLATION	--	-0.004 (1.53)	--	-0.03 (1.54)	--	0.01 (1.86)
DCPT	4.05 (5.47)	3.53 (4.66)	18.17 (3.79)	16.25 (3.30)	0.11 (5.85)	0.08 (4.87)
R-SQR	0.24	0.27	0.14	0.17	0.15	0.34

(t-statistics in parentheses)

Table 20
FINANCIAL INSTITUTIONS, ASSET DISTRIBUTION, AND GROWTH

1960 - 1989

	(1)	(2)	(3)	(4)	(5)	(6)
dep. var.	GYP	GYP	EFF	EFF	INV	INV
obs.	75	75	75	75	75	75
constant	0.90 (1.25)	1.20 (1.50)	7.12 (1.85)	9.48 (2.12)	0.09 (3.40)	0.08 (2.72)
RGDP60	-0.54 (4.04)	-0.48 (3.43)	-1.77 (2.44)	-1.56 (2.00)	-0.01 (2.03)	-0.01 (1.80)
SEC	3.57 (3.08)	3.24 (2.76)	12.36 (1.93)	12.00 (1.84)	0.05 (1.10)	0.04 (0.89)
AFRICA	-1.75 (4.37)	-1.80 (4.33)	-7.60 (3.45)	-7.61 (3.30)	-0.03 (1.76)	-0.03 (2.43)
LAAM	-1.30 (3.28)	-1.32 (2.93)	-4.52 (2.10)	-4.79 (1.91)	-0.01 (0.51)	-0.02 (1.37)
TRADE	--	0.49 (0.77)	--	1.04 (0.29)	--	0.05 (2.30)
GOV	--	-4.80 (1.24)	--	-21.79 (1.02)	--	0.09 (0.65)
INFLATION	--	-0.01 (0.06)	--	-0.01 (0.48)	--	0.01 (1.95)
BTOT	1.54 (1.10)	1.86 (1.25)	7.72 (1.02)	7.98 (0.97)	0.16 (3.10)	0.10 (1.78)
DCPT	1.68 (1.29)	1.51 (1.17)	1.20 (0.17)	1.17 (0.16)	0.03 (0.67)	0.05 (1.15)
F {BTOT= DCPT=0} (P-VALUE)	5.11 (0.009)	4.90 (0.01)	1.45 (0.24)	1.16 (0.32)	13.56 (0.01)	7.13 (0.002)
R-SQR	0.54	0.55	0.36	0.43	0.37	0.50

(t-statistics in parentheses)

Table 21
AVERAGE FINANCIAL SYSTEM SIZE
FINANCIAL INSTITUTIONS, ASSET DISTRIBUTION, AND GROWTH

	1960 - 1989		
	(1)	(2)	(3)
dep. var.	GYP	EFF	INV
obs.	75	75	75
constant	1.18 (1.63)	8.84 (2.12)	0.10 (3.62)
RGDP60	-0.56 (4.26)	-1.81 (2.40)	-0.01 (2.15)
SEC	2.89 (2.44)	11.46 (1.68)	0.03 (0.66)
AFRICA	-1.51 (3.68)	-7.07 (2.98)	-0.02 (1.28)
LAAM	-1.10 (2.74)	-4.62 (2.00)	-0.002 (0.14)
QLLY	2.74 (1.91)	6.34 (0.77)	0.07 (1.36)
BTOT	0.60 (0.41)	3.16 (0.38)	0.13 (2.48)
DCPT	1.53 (1.20)	1.75 (0.24)	0.03 (0.58)
R-SQR	0.56	0.36	0.43

(t-statistics in parentheses)

Table 22

FINANCIAL INSTITUTIONS, ASSET DISTRIBUTION, AND GROWTH

Five Year Averages: 1960 - 1989

	(1)	(2)	(3)	(4)	(5)	(6)
dep. var.	GYP	GYP	EFF	EFF	INV	INV
obs.	337	337	337	337	337	337
constant	0.61 (0.96)	1.94 (2.68)	1.81 (0.44)	8.72 (1.87)	0.12 (7.79)	0.12 (7.29)
RGDPI	-0.28 (4.49)	-0.22 (3.45)	-1.37 (3.45)	-1.10 (2.70)	-0.003 (2.07)	-0.002 (1.65)
AFRICA	-2.82 (7.40)	-2.63 (6.92)	-13.12 (5.31)	-11.60 (4.70)	-0.02 (2.30)	-0.03 (3.86)
LAAM	-2.20 (5.91)	-2.18 (5.72)	-9.85 (4.08)	-9.07 (3.66)	-0.01 (1.13)	-0.02 (2.84)
TRADE	--	0.23 (0.43)	--	-2.95 (0.87)	--	0.09 (7.62)
GOV	--	-10.0 (3.41)	--	-49.71 (2.61)	--	-0.03 (0.50)
INFLATION	--	-0.004 (1.74)	--	-0.03 (1.77)	--	0.00 (1.67)
BTOT	2.48 (1.97)	2.99 (2.27)	15.15 (1.85)	21.72 (2.54)	0.15 (4.94)	0.06 (2.21)
DCPT	2.49 (2.30)	1.74 (1.60)	8.64 (1.23)	3.26 (0.46)	0.01 (0.50)	0.04 (1.78)
F {BTOT= DCPT=0} (P-VALUE)	17.03 (0.001)	13.57 (0.01)	8.93 (.01)	8.74 (.01)	30.52 (0.01)	14.42 (0.01)
R-SQR	0.25	0.28	0.15	0.18	0.21	0.35

(t-statistics in parentheses)

Table 23

FINANCIAL SIZE, INSTITUTIONS, ASSET DISTRIBUTION AND GROWTH

Five Year Averages: 1960 - 1989

	(1)	(2)	(3)	(4)	(5)	(6)
dep. var.	GYP	EFF	INV	GYP	EFF	INV
obs.	337	337	337	337	337	337
constant	0.66 (1.03)	2.31 (0.56)	0.11 (7.77)	1.99 (2.76)	9.31 (1.99)	0.11 (7.17)
RGDPI	-0.24 (3.45)	-0.94 (2.13)	-0.006 (4.00)	-0.17 (2.47)	-0.68 (1.51)	-0.005 (3.02)
AFRICA	-2.93 (7.53)	-14.28 (5.69)	-0.01 (1.34)	-2.76 (7.05)	12.80 (5.10)	-0.03 (3.00)
LAAM	-2.28 (6.05)	-10.73 (4.42)	-0.003 (0.39)	-2.28 (5.87)	10.02 (3.99)	-0.02 (2.18)
TRADE	--	--	--	0.38 (0.71)	-1.48 (0.43)	0.08 (6.84)
GOV	--	--	--	-10.17 (3.47)	-51.27 (2.70)	-0.02 (0.37)
INFLATION	--	--	--	-0.005 (1.78)	-0.03 (1.83)	0.00 (1.78)
QLLY	-1.23 (1.34)	-13.23 (2.23)	0.10 (4.74)	-1.24 (1.34)	-11.89 (1.99)	0.07 (3.35)
BTOT	2.80 (2.18)	18.52 (2.24)	0.12 (4.15)	3.17 (2.40)	23.48 (2.74)	0.05 (2.39)
DCPT	2.40 (2.21)	7.60 (1.09)	0.02 (0.83)	1.68 (1.54)	2.62 (0.37)	0.05 (1.96)
R-SQR	0.25	0.16	0.26	0.29	0.19	0.37

(t-statistics in parentheses)

Table 24-A

Interest Rates and Growth

1974-89

	Very Fast >2.42	Fast ≥1.24 <2.42	Slow ≥-0.71 <1.24	Very Slow <-0.71	Correlation (P-value)
RID	0.01	-0.28	-0.33	-3.68	0.22 (0.063)
GYP	4.02	1.92	0.15	-1.66	
No.Obs.	19	23	19	12	

RID - Average Real Deposit Interest Rate: 1974-89

GYP - Average Real Per Capita Growth Rate: 1974-89

* Three RID outliers with values less than -18% were removed

Table 24-B

SEVERELY NEGATIVE REAL RATES
AND
GROWTH

1974-1989

	<u>GYP</u> (Number of observations)	<u>INV</u>	<u>EFF</u>
Real interest rate LESS than -5.0%	-0.26 (10)	0.19 (9)	-3.43 (9)
Real interest rate GREATER than -5.0%	1.58 (66)	0.23 (63)	6.55 (63)

Table 25

REPRESSED INTEREST RATES AND GROWTH

1974 - 1989

	(1)	(2)	(3)	(4)	(5)	(6)
dep. var.	GYP	GYP	GYP	EFF	EFF	INV
obs.	62	62	62	62	62	62
constant	2.03 (2.98)	2.16 (3.22)	3.03 (3.21)	9.04 (2.87)	11.47 (2.56)	0.22 (9.38)
RGDP74	-0.25 (1.98)	-0.25 (2.00)	-0.19 (1.30)	-0.81 (1.37)	-0.50 (0.73)	-0.01 (0.73)
SEC	3.05 (1.92)	2.95 (1.91)	2.53 (1.43)	9.88 (1.36)	7.23 (0.86)	0.07 (1.25)
AFRICA	-1.96 (2.95)	-1.86 (2.87)	-1.77 (2.60)	-8.56 (2.80)	-8.36 (2.58)	-0.01 (0.57)
LAAM	-2.53 (3.81)	-2.48 (3.82)	-2.50 (3.55)	-8.79 (2.87)	-9.36 (2.80)	-0.03 (1.21)
TRADE	--	--	0.61 (0.68)	--	2.12 (0.50)	0.06 (2.18)
GOV	--	--	-8.63 (1.48)	--	-29.40 (1.06)	0.32 (1.80)
INFLATION	--	--	-0.01 (0.01)	--	0.07 (0.56)	-0.01 (0.97)
REPINT	--	-1.18 (1.99)	-1.21 (1.41)	-8.45 (3.02)	-10.23 (2.51)	-0.01 (0.06)
R-SQR	0.40	0.44	0.46	0.43	0.44	0.42

(t-statistics in parentheses)

Table 26
CORRELATIONS AMONG FINANCIAL INDICATORS
1960-89

	GYP	QLLY60	QLLY	BTOT	DCPT
GYP	1.00 (0.000)	0.46 (0.002)	0.64 (0.001)	0.46 (0.001)	0.39 (0.003)
QLLY60	0.46 (0.002)	1.00 (0.000)	0.85 (0.001)	0.68 (0.001)	0.58 (0.001)
QLLY	0.64 (0.001)	0.85 (0.001)	1.00 (0.000)	0.68 (0.001)	0.54 (0.001)
BTOT	0.46 (0.001)	0.68 (0.001)	0.68 (0.001)	1.00 (0.00)	0.80 (0.001)
DCPT	0.39 (0.003)	0.58 (0.001)	0.54 (0.001)	0.80 (0.001)	1.00 (0.000)

(P-Values in Parentheses)

Table 27
CORRELATIONS AMONG FINANCIAL INDICATORS
1974-89

	GYP	QLLY73	QLLY	BTOT	DCPT	REPINT
GYP	1.00 (0.00)	0.44 (0.001)	0.42 (0.001)	0.42 (0.001)	0.36 (0.006)	-0.28 (0.013)
QLLY73	0.44 (0.001)	1.00 (0.000)	0.90 (0.001)	0.67 (0.001)	0.50 (0.001)	-0.26 (0.034)
QLLY	0.42 (0.001)	0.90 (0.001)	1.00 (0.000)	0.61 (0.001)	0.45 (0.001)	-0.31 (0.009)
BTOT	0.42 (0.001)	0.67 (0.001)	0.61 (0.001)	1.00 (0.000)	0.80 (0.001)	-0.46 (0.001)
DCPT	0.36 (0.006)	0.50 (0.001)	0.45 (0.001)	0.80 (0.001)	1.00 (0.000)	-0.50 (0.001)
REPINT	-0.28 (0.013)	-0.26 (0.034)	-0.31 (0.009)	-0.46 (0.001)	-0.50 (0.001)	1.00 (0.000)

(P-Values in parentheses)

Table 28

CORRELATIONS AMONG POLICY INDICATORS

1960-1989

	QLLY	QLLY60	BTOT	DCPT	GOV	SURPLUS	TRADE	INFLATION
GYP	0.64 (0.001)	0.46 (0.001)	0.46 (0.001)	0.39 (0.001)	0.09 (0.365)	0.23 (0.085)	0.28 (0.004)	-0.16 (0.010)
QLLY		0.85 (0.001)	0.68 (0.001)	0.54 (0.001)	0.25 (0.016)	0.13 (0.334)	0.31 (0.003)	-0.1 (0.108)
QLLY60			0.68 (0.001)	0.58 (0.001)	0.24 (0.063)	0.25 (0.093)	0.34 (0.006)	-0.15 (0.225)
BTOT				0.80 (0.001)	0.39 (0.001)	0.16 (0.256)	0.35 (0.001)	-0.15 (0.171)
DCPT					0.30 (0.006)	0.42 (0.002)	0.25 (0.022)	-0.13 (0.236)
GOV						-0.21 (0.109)	0.35 (0.001)	-0.16 (0.101)
SURPLUS							-0.27 (0.037)	-0.22 (0.097)
TRADE								-0.18 (0.060)

(P-Values in Parentheses)

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